

SPARROW

J.J. Garcia-Luna-Aceves
Computer Communication
Research Group (CCRG)
Computer Engineering
Department

**[http://www.cse.ucsc.edu/research/cc
rg](http://www.cse.ucsc.edu/research/ccrg)**

Results in Protocol Research

- **MAC:**
 - Receiver Initiated Multiple Access (RIMA) protocols
 - Receiver-Initiated Channel Hopping (RICH) protocols
 - Collision Avoidance Transmission Scheduling (CATS) protocols and other topology-dependent transmission scheduling protocols
- **Routing:**
 - STAR
 - BEST (bandwidth efficient source tracing)
 - DST (dynamic source tracing)
 - Link-state routing over unidirectional links
- **QoS:**
 - QoS routing architecture that provides performance guarantees with very small state at routers.
 - Subset of QoS signaling being implemented

Protocol Development

- STAR has been proposed to the IETF; new Internet Draft with **embedded multicast** will be submitted “soon”.
- Embedded multicast, not CAMP, will be supported in SPARROW prototypes for July demo.
- QoS work needed for interoperation in experiments targeted for completion by mid April.
- SPARROW MAC protocols implemented only in simulation by July 2000 (CATS, RICH, other topology-dependent transmission scheduling approaches).
- DST or hybrid of DST and BEST routing protocols could be shown in prototypes (main demo effort is STAR based).
- Work on CAMP continues but can be shown only in simulations.

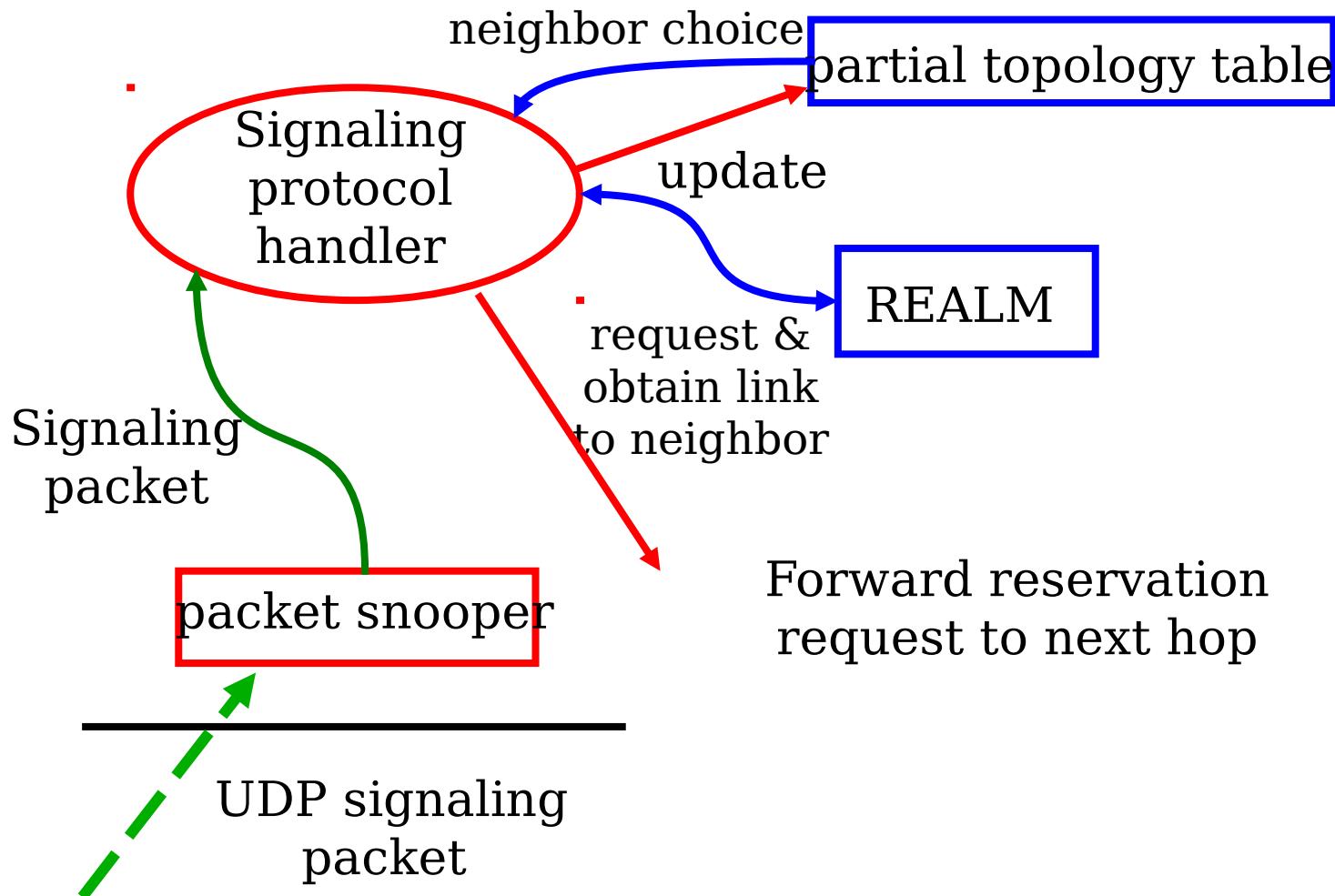
Modeling Summary

- PARSEC model of STAR
 - Almost completed; tests in the next two weeks
 - Collaboration with UCLA after that
 - We can try to implement scalable STAR
- OPNET model of STAR and CAMP, in collaboration with ASPEN almost there
 - Debug and integrate in SEAMLSS
- What we could do (with one grad until April):
 - Scalable STAR or QoS signaling

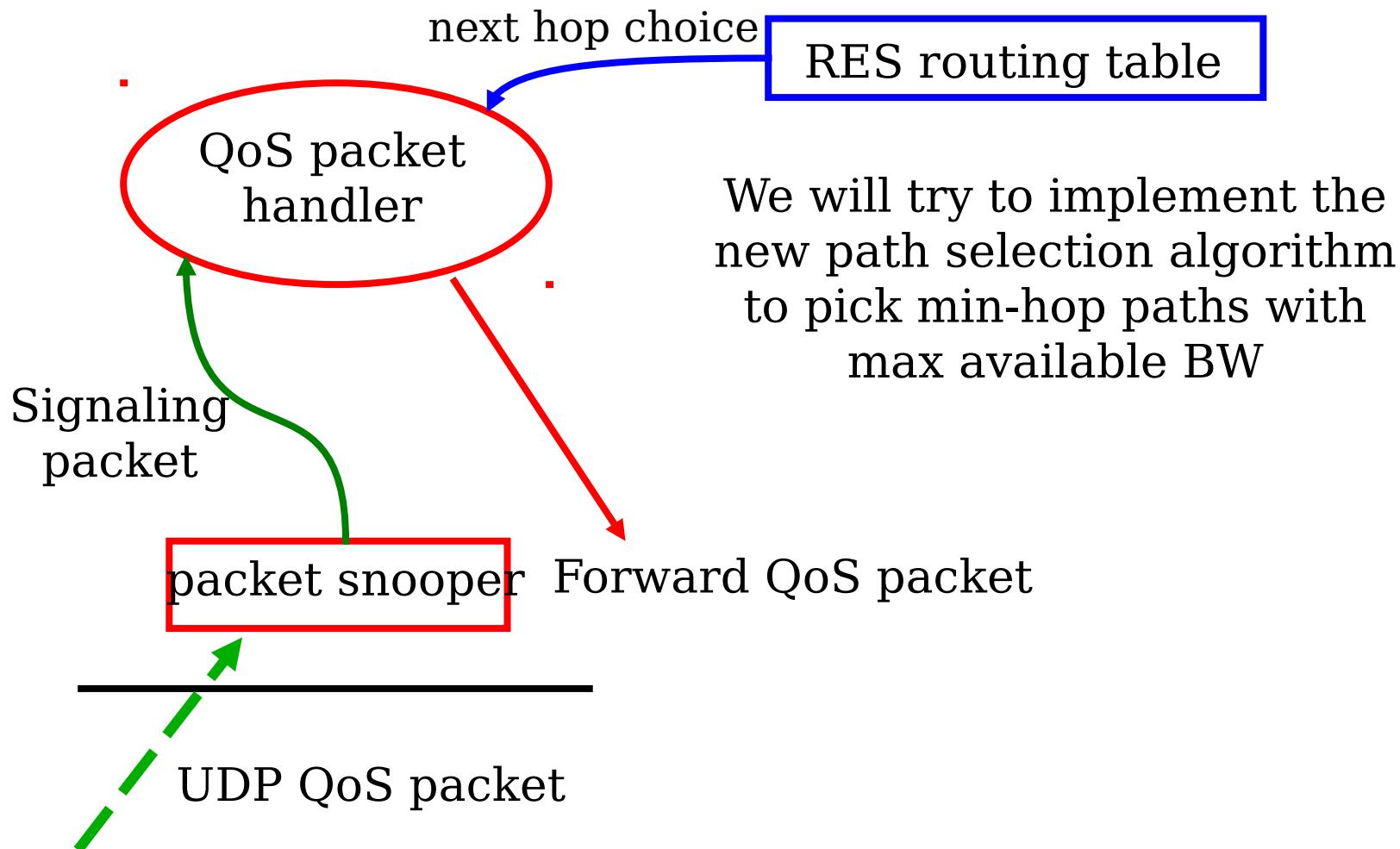
Medium-Term QoS Approach

- **Goal:** Implement minimum signaling and minimum QoS guarantees that can be demonstrated in July demo.
- **Time:** Target is April 17 deadline.
- **Approach:**
 - Use off-the-shelf IP routing table (single next hop per destination).
 - Consider bandwidth available over links in route computation.
 - Establish bandwidth reservations to provide QoS guarantees.
 - Source router remembers source-destination pairs for which reservations are made.
 - STAR updates specify link bandwidth available.
 - ETE reservation signaling is mapped into SPARROW signaling, which is based on destination.
 - Packets within a connection are sent with precedence 001 and bits 6 and 7 set to 11.

Medium Term QoS Approach



Medium Term QoS Approach



- **Bypass IP to use a separate routing table**